### Rhythmic variation.

It is a general axiom in 'breeding' and in allied biological discussions, that 'like produces like;' and yet in nature, or under art, we have no instance we can use where like has produced an identical likeness. It rather seems that the practical expression should be the converse one, that 'variation produces variation;' for in nature we find variation the general fact, no animal and no plant producing offspring precisely similar to itself. Indeed, as the attribute of life is motion and but momentary equilibrium between internal and external forces, we may consider variation as an empirical law of nature, and as influenced by the law of rhythm, as outlined by Herbert Spencer, who says that rhythm results wherever there is a conflict of forces not in equilibrium.

This law of rhythm seems sufficient to explain, in part or in whole, some of the variations observed in species, and for which neither natural nor sexual selection can account. Given organisms under similar environment, and remote from selective opportunity, we must believe that variations must occur; and these variations must naturally become grouped about types under the action of heredity and some other general laws, giving through rhythmic action the appearance of progressive development.

Probably this law of rhythmic movement may explain the interesting variations which have originated species in certain protoplasmic organisms, as so well described by Professor Asa Gray (*Amer. journ. sc.*, April, 1884, 327), who says, —

"No exercise of 'natural selection' could produce the successive changes presented in the evolutionary history of the typical Orbitolites, from Cornospira to Spiroloculina, from Spiroloculina to Peneroplis, from Peneroplis to Orbiculina, from Orbiculina to the 'simple' forms of Orbitolites, and from the 'simple' to the 'complex' forms of the last-named type. And as all these earlier forms still flourish under conditions which (so far as can be ascertained) are precisely the same, there is no ground to believe that any one of them is better fitted to survive than another. They all imbibe their nourishment in the same mode, and no one type has more power of going in search of it than another. That they are all dependent on essentially the same conditions of temperature and depth of water, is shown by their occurrence in the same marine areas. That they all equally serve as food to larger marine animals, can scarcely be doubted; and it is hardly conceivable that any of their devourers would discriminate (for example) between the disks of a large O. marginalis, or middle-sized O. duplex, and a small O. complanata, which even the trained eye of the naturalist cannot distinguish without the assistance of a magnifying-glass."

E. LEWIS STURTEVANT.

Geneva, N.Y., April 12.

### Rare Vermont birds.

In a list of birds given under this heading in No. 55 of *Science*, appeared the American avocet (Recurvirostra americana Gm.) and orange-crowned warbler (Helminthophaga celata Say, Bd.). It appears, these were admitted on mistaken evidence, and are not to be considered as Vermont birds.

FRANCIS H. HERRICK.

---

## *THE APRIL SESSION OF THE NATIONAL ACADEMY OF SCIENCES.*

THE number of papers presented at the session of the National academy of sciences in Washington last week was less than usual, and, judging from the discussions, none were of commanding interest and importance. An unusual number of prominent members were absent from the meeting; and it also happened that the social re-unions which have usually accompanied the annual session were, from various accidental circumstances, omitted. It has long been a custom, if not an unwritten law, of the academy, to decline all social attentions which do not come either from members or officers of the academy, or from heads of government departments interested in its work.

An interesting feature of the meeting was a communication received from Mrs. J. Lawrence Smith, widow of the late lamented chemist of Louisville, proposing to give the sum of eight thousand dollars, which she had received from Harvard college by the sale of Professor Smith's collection of meteorites, to establish a memorial fund for the promotion of meteoric research. The academy will then have four considerable funds for the promotion of science, — the Bache, Draper, Watson, and Smith funds.

The following were some of the more interesting of the physical papers: —

It has long been a well-known result of theoretical mechanics, that the rotation of the earth causes a slight tendency in any southward-flowing river of the northern hemisphere to press towards its right bank; and various phenomena have been attributed to this, among others a supposed tendency of driftwood to accumulate on the right rather than on the left bank. It is, however, readily shown that this tendency could not produce this effect; and the general conclusion has been, that the only effect would be an imperceptible difference of level of the two sides of the river. The object of the first paper read — that of Mr. Gilbert, on the deflection of river-courses in consequence of terrestrial rotation — was to point out an indirect result of the forces in question, which had hitherto been overlooked, and which might produce observable results. He showed that the effect of terrestrial rotation is to increase the centrifugal force on those curves which deflect the river from the right towards the left, and to diminish the force in the opposite direction; the difference in the case of the Mississippi River being about one-tenth part of the whole.

In his paper on the origin of crystalline rocks, Dr. Sterry Hunt conceived that rocks, like gneiss and other felspathic, hornblendic, and quartzose aggregates, resulted from the action of water on the superficial and last congealed part of the earth's crust, through upward lixiviation. The separation of zeolites and quartz from basic rocks is a survival of this process of deposition from mineral springs,